WATER RESOURCES

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SELECT COMMITTEE ON NATIONAL WATER RESOURCES UNITED STATES SENATE

EIGHTY-SIXTH CONGRESS

FIRST SESSION

PURSUANT TO

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FORT SMITH, ARK., NOVEMBER 28, 1959

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(Pursuant to S. Res. 48, 86th Cong.)

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WATER RESOURCES

SATURDAY, NOVEMBER 28, 1959

U.S. SENATE,
SELECT COMMITTEE ON NATIONAL WATER RESOURCES,
Fort Smith, Ark.

The select committee met at 9:30 a.m., pursuant to Senate Resolution 48, in the Gold Room, Ward Hotel, Fort Smith, Ark.

Present: Senators Kerr (presiding), Moss, and McClellan.

Present also: Theodore M. Schad, staff director of the select committee and Paul McBride, chief clerk.

The CHAIRMAN. Senator Moss and I am very happy to be here in Arkansas and have the opportunity to visit with the good people of this sister State of Oklahoma.

I am happy to tell Senator Moss that there is a dividing line between Arkansas and Oklahoma but that none of the citizens of either State pay any attention to it. We have a community of interest, Senator Moss, since we constitute such large portions of the river basin of two great rivers, the Arkansas and the Red.

Then in the days when Oklahoma consisted of two territories, the Indian Territory and the Oklahoma Territory, the seat of law for the Indian Territory, where I was born, was Fort Smith, Ark. They imported some foreigner here in the early days by the name of Parker and made him a Federal judge. He was given enough power (along with the way he exercised it and added to it) to have quite an influence on the Indian Territory. A good many of our better known citizens wound up their earthly career right here in Fort Smith.

We lived under the Mansfield Code in Oklahoma, in the Indian Territory until statehood; the Mansfield Code being the codification of Arkansas laws.

I remember an early-day justice of the peace there in Pondcreek County, about the only court we had in a certain area of the county. At statehood the legislature passed a law that any man who had had his shingle out and acted like a lawyer and claimed to be one would, upon the certification of the committee selected by the local bar in each county, be licensed as a lawyer.

They had this old boy before them and were inquiring into his qualifications. He told them that he came to Oklahoma with a marriage certificate and a pillowslip full of legal documents and figured that would give him a little edge on everybody else in the area and he started practicing law and opened an office as the justice of the peace.

That is not indicative of the way we still operate but shows the close relationship between the two States.

When I went to the Senate I do not recall whether I found John there or John found me, but I soon learned that he and his distinguished colleague, Senator Fulbright, were working on matters that were of great benefit to Arkansas, and incidentally, also to Oklahoma. And I joined up with them, and we have worked together through the years quite happily.

Oklahoma has a third Senator unofficially in the identity of Don McBride. Arkansas has a third Senator unofficially in the identity of Jim Trimble. I think he gets paid, though, as a Member of the House of Representatives.

Our committee is seeking to get at the grassroots, from the voice of the people themselves, as full a picture as possible of the needs for additional water for agricultural, industrial, and municipal growth over the period of the next two decades, what those needs will be, where the water is to be found to meet those needs, and how conservation can better serve the people of the States and the Nation.

It is our belief that when we become sufficiently familiar and acquainted with the needs of the individual States, then we will have the data from which to file our report indicating the needs of the Nation.

Again I want to tell you, Senator McClellan, how happy we are to be here and I know that Senator Moss from the great friendly State of Utah and one of the men who has been a working member of this committee is also glad to be here.

And do you have any remarks to make, Senator Moss?

Senator Moss. No; except to express for myself my pleasure at being here with Senator McClellan, to be in Arkansas, and to be here with the chairman, Bob Kerr.

This Select Committee on National Water Resources has embarked on a very extensive study. I think this is the 17th hearing that has been held this fall and we still have some six or seven yet to be held before the end of the year.

We have been in all sections of the country. We will have been just about everywhere in the United States by the time the series is completed. We held a hearing in Salt Lake City on Tuesday of this week and we are here today and going on out to Oklahoma City and then on to Louisiana and so on.

The information that we have gathered is of great value. We have heard from people at the grassroots in all sections of our country and I believe that we will be able to bring together a very comprehensive report on the needs that we have in this country and will have by 1980 for water.

I am very pleased to be down here and to participate in these committee hearings. It is sort of a free education to go around and learn so much from the people of this Nation and it is a privilege to serve with Bob Kerr and to be here in Arkansas with John McClellan.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Moss.

We had a very fine statement from your Governor and the State agencies having to do with water resources.

We have here in front of me what appears to be a loud-speaking device. I do not think it is working mechanically but its presence here gives me some confidence and I am sure it is at least psychologi-

cally effective in causing you to think you are hearing better whether you are or not.

Senator McClellan, we will be glad to have any statement you care to make now or later but also to present for their statements the witnesses from your State.

I want you to be aware that there is a select committee here from Oklahoma who have infiltrated into this meeting and they are going to try to learn everything they can about the trade secrets and the plans of Arkansas because they not only are going to originate all they can, but if Arkansas develops anything they have not thought of, they are going to imitate you.

Senator McClellan.

STATEMENT OF HON. JOHN L. McCLELLAN, U.S. SENATOR FROM THE STATE OF ARKANSAS

Senator McCLELLAN. Thank you, Senator Kerr.

On behalf not only of all the Arkansas delegation but of the people of my State we are happy to welcome you, Senator Moss, and the committee to Arkansas to carry on your work which was intended to be and will prove to be a definite service to our country and an aid to the Congress in meeting its responsibilities in the field of legislation looking toward the development, the conservation, and the best use of the water resources of our country during the next two decades or quarter of a century.

We would not be surprised, I may say, of course, that Oklahoma would continue to imitate Arkansas if we develop anything worthwhile.

The CHAIRMAN. We are even looking carefully at this football coach you have.

Mr. RIDGWAY. Stay away from him.

Senator McCLELLAN. We dispatched him over to Atlanta last night to look over the situation and ascertain which one of those teams we wanted to win today, the one we could surely defeat. I believe Georgia and Georgia Tech are playing there.

But back to the serious aspect of the moment, we have here a number of people, of our citizens of the State, who have heretofore been and are presently vitally interested in our water resources and who have been doing much to help get them developed and help secure the legislation and appropriations that we have needed to further the water resources program of our State.

These witnesses that it is going to be my pleasure to present to this committee are people who know the grassroots sentiment of our citizens and who also know, I think, better than anyone else—unless it is the technical experts in the field—what is needed for our State and how best our water resources can be conserved and developed to meet the needs of the tremendous increase in population that is confronting us within the time that we are considering here in this inquiry, so it is going to be my pleasure now to present these witnesses to you, Mr. Chairman.

First, I shall present a man who does not need an introduction, the very able Congressman from this district, my friend Jim Trimble, who as everyone in his district knows, has dedicated himself to the projects that have shown economic justification and who has worked

as hard as anyone could in the Congress to further the interest of his people in this great resource development.

I am very happy to present to you Congressman Trimble.

Jim, will you come around, please, sir.

STATEMENT OF HON. JAMES W. TRIMBLE, MEMBER OF CONGRESS FROM THE STATE OF ARKANSAS

Representative TRIMBLE. Senator Kerr, Senator Moss and Senator McClellan; I am humbled by this opportunity to appear before this great committee on a cause which I think is one of those up front in our economic future as well as our national standing, international standing.

I can see out in the future where water, or rather, the lack of water is our great concern.

The CHAIRMAN. Just a minute, Congressman. Can the folks in the back of the room hear the Congressman.

The AUDIENCE. Yes.

The CHAIRMAN. I tell you right now that is about as good a demonstration of mind over matter as I have ever seen.

Go right ahead, Jim.

Representative TRIMBLE. I was startled a few years ago to hear the Corps of Engineers and the soil conservation people testify that our water level is receding on the average of one foot per year generally speaking throughout the United States. In other words, if you and I, Senator Kerr, went back to the old home where we were reared, and drilled a well to sustain our family and the livestock we would have to go on the average of about 25 feet deeper to get that sustaining yield than our fathers did.

So it is well that this great committee of yours is making a general survey to bring under one agency, if possible, the control and development of our water reservoirs, because as our population increases then our industry increases, the sizes of our cities increase and municipal and industrial water supply is so vital to our very existence as a Nation.

And I do not want to take up the time here this morning of those who have come so far to testify, who are close to this issue and who must get in this record. I shall get in later on. But I have with me this morning 25 copies of a statement by the Chamber of Commerce of the city of Rogers in Benton County, which I would like to present to the committee.

The CHAIRMAN. We will make the copy a part of the record, Congressman.

Representative TRIMBLE. And also a statement by the Chamber of Commerce of the city of Bentonville in Benton County and then a statement by Col. C. C. King, the mayor of the city of Eureka Springs.

These three statements are on the general theme that you and Senator McClellan and Senator Moss have already mentioned and I have mentioned, the water conservation policy. They are at the grassroots. They speak the language that you and I like to hear. They are with us in this great cause of development.

Without any further time taking here I want to hear the others who have come to testify and I am at your command, you and Senator

John are my quarterbacks. And we will let Senator Moss, even though he is in Utah, far out in the arid section, come along and help us and we are grateful for your presence, Senator Moss. It is wonderful to have you here.

Senator Moss. Thank you.

Representative TRIMBLE. Thank you very much.

Senator Moss. Thank you, Jim.

(The statements referred to follow:)

CHAMBER OF COMMERCE,
Rogers, Ark., November 27, 1959.

The board of directors of the Rogers Chamber of Commerce presents the following resolution in support of the construction of the Beaver Reservoir in northwest Arkansas:

"Whereas a study of present and future water needs of Washington and Benton Counties, conducted by both the University of Arkansas Industrial Research and Extension Center and the U.S. Public Health Service, shows that an acute water shortage will be prevalent in this area; and

"Whereas the industrial development and related growth of this area will be dependent on its water supply; and

"Whereas this natural resource belongs to the people of this area and should be conserved for their use; and

"Whereas the creation of this reservoir will protect the people from the ravages of flood in addition to proving a supply of water and electric power: Now, therefore, be it

"*Resolved*, That this body, representing the people of Rogers, strongly urge that every possible expediency be given the construction of this reservoir."

DORMAN F. BUSHONG,
President, Rogers Chamber of Commerce.
R. DALE CHRISTY,
Manager, Rogers Chamber of Commerce.

CHAMBER OF COMMERCE,
Bentonville, Ark., November 25, 1959.

The board of directors of the Bentonville Chamber of Commerce and the City Council of Bentonville present the following resolution in support of the construction of Beaver Reservoir;

"Whereas a study of present and future water needs of Washington and Benton Counties, conducted by the University of Arkansas Industrial Research and Extension Center, shows that by 1971 an acute water shortage will be manifest in this area; and

"Whereas the growth and development of this area will be dependent on its water supply; and

"Whereas this natural resource belongs to the people of this area and should be conserved for their use; and

"Whereas the creation of this reservoir will in no way deprive or harm any other peoples, but will in fact protect them from the ravages of flood, etc.: Now, therefore, be it

"*Resolved*, That these two bodies, representing the people of Bentonville, strongly urge that every possible expediency be given the construction of this reservoir."

OTIS CORLEY,
President, Bentonville Chamber of Commerce.
J. N. CAVNESS,
Mayor of Bentonville.

STATEMENT OF COL. C. C. KING, MAYOR, EUREKA SPRINGS (CARROLL COUNTY) ARK.

Mr. Chairman and members of the committee, in addition to the citizens of Eureka Springs, Ark., I feel that I can speak for the people of a number of counties in both the Arkansas and Missouri Ozarks, who are essentially economy-minded people and vitally interested in water conservation. These people are

fortunate in living in an area of abundant water at present but periods of drought which seem to occur at more frequent intervals, as the time goes by, have made them realize the need of proper use and conservation of their water resources. As evidence of this you seldom find a farm today without stock tanks or ponds. Ozarkians have seen another great natural resource sadly depleted without replacement—the once great supply of virgin timber, and they do not want the same thing to happen to their water.

We have welcomed Government constructed dams and reservoirs in our areas such as Norfolk, Bull Shoals, Table Rock and Beaver, which is just entering the construction phase, because of the benefits of flood control, electric power and recreational facilities, and have viewed with whole-hearted approval the more recent recognition of the need to add municipal and industrial water supply and irrigation to the benefits to be derived from these reservoirs. We fully realize that the constant lowering of water tables throughout the entire country is just cause for alarm, and appreciate the concern of your committee.

Therefore, we respectfully request and urge that every consideration be given to the retention of central control, and regulation of the conservation and exploitation of water resources throughout the entire United States insofar as Government participation is concerned, by Congress itself, with one Government agency, probably the Corps of Army Engineers, making the recommendations coordinating and carrying out the directives of Congress. We feel that "too many cooks spoil the broth" and in our opinion there are too many agencies involved at the present in the all important matter of water resources.

EUREKA SPRINGS CHAMBER OF COMMERCE

EUREKA SPRINGS, ARK.

POTENTIAL VALUE OF BEAVER DAM AND LAKE TO THIS AREA

Beaver Dam and Lake signals another big step in progress for the Ozarks region as a whole, and in particular for the immediate area in which the project is located.

First, it will mean adequate water supply for the increase of industrial expansion.

Second, flood control of White River and tributaries.

Third, raising of the water level throughout adjacent area of the lake.

Fourth, generation of more electric power for a wide area.

Fifth, soil conservation bordering inundated lands by the lake, resulting in additional land uses heretofore neglected and impractical.

Sixth, incentive to those interested in retiring in northwest Arkansas.

Seventh, more recreational facilities for thousands of vacationists, increased tourist income for the towns in immediate area of the lake. Should prove to be an inducement to tourists for longer vacations, or longer "stops" in the immediate area.

Eighth, we believe that Beaver Dam and Lake will prove to be the means of attracting many investors who can help to develop this area.

SAM A. LEATH, *Manager.*

Senator MCCLELLAN. Mr. Chairman, the next witness needs no introduction at all. There is no one that ever heard of the Arkansas River Basin or any water project in Arkansas that has not heard of C. F. Byrns.

Mr. Byrns has been a pioneer in the program of Arkansas and water resources development and Mr. Byrns, if you will come around, please, we will be happy to have your statement.

STATEMENT OF CLARENCE F. BYRNS, CHAIRMAN, ARKANSAS-OKLAHOMA-KANSAS TRISTATE COMMITTEE FOR ARKANSAS RIVER DEVELOPMENT, DIRECTOR AND EXECUTIVE COMMITTEE MEMBER OF THE MISSISSIPPI VALLEY ASSOCIATION AND REPRESENTATIVE OF THE FORT SMITH CHAMBER OF COMMERCE

Mr. BYRNS. Thank you, Senator.

Senator MCCLELLAN. The first time I ever met Mr. Byrns, at least the first time he ever attracted my attention, really, was when he was talking about the Arkansas River Basin, and he has been talking about it ever since and got me all stirred up about it. I have been trying to do something about it and I believe that we are making a little progress, Clarence. I still have faith we are going to reach our goal.

Mr. BYRNS. Thank you, Senator. Those are most encouraging words.

I greatly appreciate what you have just said. I am appearing here actually in several capacities. It happens that I am a chairman of the Tristate Committee of Arkansas, Oklahoma and Kansas for the development of the Arkansas River. It is our function, authorized by the Governors of the three States to represent those three States.

In our hearings before Congress it has become my privilege in the last 5 years to have a part in each of those hearings.

I am also here as a representative of the Arkansas Basin Association, which has a twin over in Oklahoma called the Arkansas Basin Development Association. I think that is because they felt they were a little behind in development, Senator. They had to put something in there to distinguish them from the group that is over here in Arkansas.

The CHAIRMAN. I thought you were to let us identify ourselves with you, not distinguish ourselves from you.

Mr. BYRNS. All right. I will accept the apologies of the Senator.

Speaking of the Senator and his apologies, he is always pulling a crack on me.

I want to tell you a little story about the Congressman's wife who woke him up in the middle of the night. She said, "Joe, Joe, wake up. There is a burglar in the house." He was kind of sleepy. "No, my dear, not in the House. Might be in the Senate but never in the House."

In addition to those two jobs I happen to be a member of the executive committee of the Mississippi Valley Association, on which I am serving my third year at this time in that great organization, which speaks for the whole mid-American country.

Then also I speak with authority from the Fort Smith Chamber of Commerce.

I am presenting for the record a written statement and in addition, another one from Mr. Verser Hicks, who is the president of the Arkansas Basin Development Association of Oklahoma and they will appear, of course, as the gentlemen know, on Monday in Oklahoma City.

Then I want to speak very briefly, because we have a number of witnesses here and a good many of them have heard me talk until they are tired of it about the Arkansas River. But my statement is not devoted entirely to the Arkansas River but rather to the whole

problem of water resources as they affect Arkansas and to a degree that you cannot separate they affect Oklahoma as well.

We have made tremendous progress in Oklahoma and in Arkansas in these recent years. Actually the whole thing was triggered, it seems to me, by the great flood in the Mississippi in 1927 when we had such tremendous losses of life and property all over the middle sections of America. Then the Corps of Engineers were authorized to get into the field of flood control and upon that authority we have built a tremendous number of projects and tremendous projects in both Arkansas and Oklahoma.

I want to say here that we have had in the Arkansas Basin, with which I am most familiar, we have had the most pleasing and most successful and effective group of people in the Congress that could possibly be imagined. There is not a single exception in Arkansas, Oklahoma, and the section of Kansas, at least that section that is in the Arkansas Basin, that has not been solidly for this program now for a long period of time.

If it had not been for the courageous and effective work of the men in the Congress, Senate and House as well, we would never have gotten off first base. We have had amazing cooperation from those people.

I want to say, too, that we are very grateful to the Bureau of the Budget; for, beginning in 1957, the Bureau of the Budget has been with us on this Arkansas River program. For a long period they were doubtful or opposed to it. Since they took over the responsibility of making appropriation requests to the Congress we have found it necessary only in a few instances to ask for more than the budget had approved. We started with $1,050,000 back there in 1955. We got about $4 million or a little bit more in 1956. In 1957 we got $18 million. In 1958 we got $31 million, and in the present budget $34,000,265 for the navigation program alone. That does not touch the flood control and power projects in Oklahoma and Arkansas that have been developed on the Arkansas.

Then we had on the White River an excellent development up there, as all of you are aware, with the few great major tables, Bull Shoals, Table Rock completed and in service, with Beaver Dam, the last of that series up in northwest Arkansas in Carroll County, just now getting underway, and Greers Ferry Dam over in eastern Arkansas in a somewhat similar situation. That has done a magnificent job for the area of the White.

The area of the Red touches us rather lightly because it comes in from Oklahoma, goes on out into Louisiana, cutting across the southwestern corner of the State. There is a great project going on down there now, which Senator Kerr is intensely interested in, the central Oklahoma project for taking water out of southeast Oklahoma and southwest Arkansas and moving it into Oklahoma City. An amazing thing, and yet it is highly feasible that it is going to be done.

In these few years we have made tremendous progress on this river and on the other rivers.

The Ouachita, incidentally, will be presented to you not here but at the Alexandria, La., hearing. I have that advice from Mr. Thatcher.

The whole field of water resources has completely changed in Arkansas and Oklahoma in the last 25 years. We paid almost no

attention to water conservation 25 years ago. Now everybody is thoroughly aware of its necessity, with the prospect of 210 million people in this country by 1970, which is merely around the corner, and the time when we will first have navigation up to Fort Smith, incidentally. Two hundred and ten million people in this country in 10 years; they have to go somewhere. Industry has to go somewhere. We are preparing here in this basin and on the other rivers that affect Arkansas and Oklahoma, programs that will make it feasible and essential that those people reach out into the places where there is abundant water, where there are abundant resources, where there are abundant people with the energy and desire to do a good day's work for a good dollar.

We are going to build this country down here into a paradise that nobody now will believe.

It is coming without any question. We have had all sorts of assistance from all the Federal agencies that deal in this State, the Soil Conservation Service has done a magnificent job. The U.S. Geological Survey people have records on waterflows and water levels all over this State, from dating back to about 1928. They have studies going on with the underground supplies in southeast Arkansas where they have underground water and very little of it back in the northwest corner of the State, the northwest half of the State. We have had excellent cooperation from everybody, including the privately owned power companies in Arkansas, and Oklahoma, Texas, Louisiana, Mississippi, and that is something that has been tremendously valuable to us because without it we would have had a split delegation instead of a consolidated delegation, all working with one hearing, one purpose, one ideal of building in this country a great paradise for industry and for people and for more income and a greater culture.

Mr. Chairman, I am not going to take any more time. I have covered the waterfront in my written statement so far as I could do so without going into the details of the thing because I know that other witnesses here will deal in more detail and with more accuracy than I could.

I thank you very much for your attention.

Senator McCLELLAN. Thank you, Mr. Byrns.

(The statements referred to follow:)

STATEMENT OF CLARENCE F. BYRNS, FORT SMITH, ARK.

Senator Robert S. Kerr, chairman, and members of the committee, my name is Clarence F. Byrns. I am editor in chief of the Southwest American and Times Record, of Fort Smith, Ark. I appear here as chairman of the Arkansas-Oklahoma-Kansas Tri-State Committee for Arkansas River Development, as a director of the Arkansas Basin Association, of Arkansas, as a director and executive committee member of the Mississippi Valley Association and the representative of the Fort Smith Chamber of Commerce.

Our people are grateful to you for your visit to Fort Smith to hear the Arkansas story of our water resources, the scope of our water development and our needs for the future.

Recognizing that you will hold hearings in Oklahoma City on November 30, I shall refer to Oklahoma resources only when associated with Arkansas. You will have information presented to you by the Arkansas Basin Development Association of Oklahoma, which I fully endorse. The Tri-State Committee works as a team, composed of three members from each of the States of Arkansas, Oklahoma, and Kansas, with official authority to speak for the States. We

work for a common objective, presenting to congressional committees one program in one hearing.

Arkansas has abundant water. Oklahoma's two major rivers, the Red and the Arkansas, discharge into Arkansas an average 37.5 million acre-feet annually. The Red crosses the State line into southwest Arkansas before it enters Louisiana. The Arkansas rises in Colorado, flows through western Kansas, central and eastern Oklahoma, and through Arkansas from Fort Smith to its junction with the Mississippi. The White River rises in northwest Arkansas and southern Missouri, flows across north Arkansas and eastern Arkansas to a junction with the Arkansas near the Mississippi. The Ouachita rises in Arkansas and flows into Louisiana in the southeastern section of the State.

While Oklahoma discharges 37.5 million acre-feet annually into Arkansas, this State adds another 43 million acre-feet, and discharges a total of 80 million acre-feet.

Arkansas is divided topographically between the mountains and rolling hills of the northwest half of the State and the coastal plains in the southeast. Large quantities of underground water are available in the coastal plains area, used for about 60 years for irrigation and municipal water supplies. Northwest Arkansas has little underground water and relies on surface flow.

Twenty-five years ago, virtually no development of the Arkansas River had occurred except for municipal purposes. Floods ravaged the valleys of all streams at intervals. There were no reservoirs for flood control, electric power production, irrigation, industrial use and municipal supplies. The only irrigation was in the ricefields of eastern Arkansas, which have been operated with ground water since the beginning of this century.

The picture today is vastly different. Other witnesses will prevent data on specific uses, now and hereafter. Please permit me to hit the high spots.

On the White River, three major dams, basically for flood control and power, have been completed on the upper segment on the stream. A fourth of that series is now under construction on the main stream and a fifth on a tributary farther downstream.

On the Ouachita, the first navigation project has had navigation established. It will be described to you at your Alexandria, La., meeting. In the upper reaches of the Ouachita, three large reservoirs are in service, the federally owned Lake Ouachita and two privately owned lakes, Hamilton and Catherine, owned by the Arkansas Power & Light Co.

On the Little Missouri in southwest Arkansas, Lake Greason is complete and producing power as well as flood control.

The Arkansas River is the largest and longest stream in the Nation not now developed for navigation. Its basin covers an area approximately equal to the combined area of Missouri, Illinois, and Ohio. The first flood control projects in the Arkansas Basin were completed in 1941; one in Oklahoma, one in Arkansas. The Second World War stopped other construction until the end of the war. Congress approved the comprehensive program of the Corps of Engineers for full development of the Arkansas Basin in 1946. Prewar projects were completed. Emergency bank work was started and is continuing. Actual work on the navigation channel and its related reservoirs began in 1955. Congressional appropriations have increased each year. Total appropriated funds including fiscal 1959–60 now total in excess of $100 million.

Three major dams essential to the navigation program are well along with construction. Pouring of concrete in the first lock on the navigation channel, at Dardanelle, Ark., was started early this month, as part of a $3,100,000 contract let last March. Bids were received early in November for the main spillway on Keystone Dam, on the Arkansas upstream from Tulsa. Bids will be received early in December on a similar project on the Eufaula Dam on the Canadian River. Material increases in appropriations are necessary to keep the project on schedule.

Arkansas and Oklahoma have lagged in population growth since 1940. The reason is twofold: Farm mechanization taking many people off the farms; and high freight rates in these two landlocked States, which effectively prevent bringing into the two States heavy industry which now goes almost exclusively to the inland waterways.

The abundant waters of Arkansas and Oklahoma, when developed for navigation, for industrial, municipal, and agricultural use will attract industries as similar projects have done on all the inland waterways. The barriers which now

beset us will be removed and we shall be able, for the first time, to compete with the other valleys of the Mississippi system.

Arkansas fully agrees with Oklahoma and Kansas in urging a much more rapid construction than is available under present appropriations. The target date for completion from the Mississippi River to Tulsa is now set at 1972. We submit that every year of delay increases the cost to the Government and denies to the people of the Arkansas Basin the great annual benefits that have been unquestionably established by repeated surveys and reappraisals.

In contrast with the free-flowing rivers of 1935, the projects already completed in Oklahoma prevented damages of 37 millions in Oklahoma and approximately 8.5 million in Arkansas during a flash flood in October of this year. Since flood control reservoirs were started on the Arkansas Basin, the damages prevented have added up to more than a third of their total cost, while the average time they have been in service is about 9 years.

In the area that affects floods in Arkansas, there are five reservoirs in Oklahoma and two in Arkansas which were directly responsible for preventing $3 million of damages in Arkansas alone in the recent floods. The five reservoirs in Oklahoma in the Port Smith area have a total capacity for floodwater of 2,700,000 acre-feet. Completion of Eufaula, Keystone, and Oologah in Oklahoma will more than double the present storage.

One vital segment of the Arkansas River navigation program is bank stabilization and channel rectification. The budget for fiscal 1960 includes $5 million (less 2.5 percent) for this purpose, classified as emergency funds. We believe this phase of the project should be considered as it actually is a permanent part of the whole program, and that annual appropriations for this work should be materially expanded.

Gen. William Whipple, Southwest division engineer, told Senate and House committees in April 1959 that the engineers could use $9,500,000 for bank work. He emphasized that sound engineering requires that full use should be made of the silt now coming down the river in the 5 years needed to complete Eufaula and Keystone Dams. The silt, he pointed out, can be used to great advantage to stabilize dikes and revetments essential to the channel control. After the two big dams on the Canadian and Arkansas Rivers are completed, the silt-load is held in those reservoirs, the clear water discharged will scour out the channel below and compel the river to do much of the work in the navigation channel. Thorough studies of this problem indicate that much money will be saved and the number of low-head dams can be reduced in number with savings in the millions, provided sufficient bank stabilization has been completed. The Tri-State Committee, representing Arkansas, Oklahoma, and Kansas, urged the higher appropriation proposed by General Whipple in the April 1959 hearings, the only change in the President's budget which was requested.

The U.S. Geological Survey, in cooperation with Arkansas State government, has compiled comprehensive and continued water resource records since 1928. The surface water division of USGS, headquartered at Ford Smith, now has available accurate information on streamflows and reservoir levels in the State, essential tools for water resource planning.

Annual State appropriations for USGS activities now total $25,000 for surface water, $30,000 for ground water and $16,000 for quality of water studies. These funds are substantially matched by Federal funds.

The surface water division has been cooperating with the Soil Conservation Service for the past 5 years in intensive hydrological studies on Six Mile Creek, one of the pilot watershed protection projects in the Nation. The USGS has nine recording rainfall gages on streams and reservoirs in the Six-Mile area and a total of 59 rainfall gages, including 9 recording stations, averaging about 1 to each 3 square miles. The cost of this project is paid entirely by the Soil Conservation Service.

All of Arkansas is now covered by 74 soil conservation districts, working on the local level in cooperation with the U.S. Soil Conservation service in water and soil conservation. Arkansas was the first State to authorize such districts. In addition to the Six-Mile watershed project, now virtually complete, four other projects are now in various stages leading to construction and almost half a hundred applications for watershed projects are on file, awaiting surveys. Beginning in 1957, the State has provided funds for an additional survey crew.

Arkansas' 20 million acres of forest land have made material contributions to water resource conservation. Wherever forest cover is protected from fire, the soil becomes a great reservoir of surface water, reducing flash floods and

providing a continuing flow of water through springs. In the years ahead, forests will be as valuable for water supplies as for timber. The U.S. Forest Service owns 1.5 million acres net in the Ouachita National Forest and $1,050,000 net in the Ozark National Forest. Additional lands in private ownership within the national forests' boundaries bring the total protected by the U.S. Forest Service to almost 4 million acres. The remaining 16 million acres of forests in private ownership and the U.S. national forests are so well protected from fire that the average annual burn is now about one-third of 1 percent.

Irrigation of farmlands outside the long-established rice areas of Arkansas is growing rapidly. In 1949, only 16,000 acres outside the rice area were fitted for irrigation. In 1957, the last dry year, the total acreage outside rice which was equipped for irrigation was about 500,000 acres.

A study of irrigation potentials made in 1953 by a Bureau of Reclamation party, at the request of the Arkansas-White-Red Interstate Committee, estimated that more than 3 million acres in Arkansas are susceptible of development for irrigation by adequate control of the State streams.

Pollution control is gaining momentum everywhere in Arkansas and in the Arkansas Basin upstream. The Arkansas Pollution Control Commission was created in 1949 by the legislature, but had virtually no funds until 1957. The commission is actively working now on pollution controls and industries and municipalities are responding.

Arkansas and its neighbor States have been fortunate in having wide public support for water resource conservation and use. Private power companies operating in Arkansas and Oklahoma have supported the Arkansas Basin development since it was submitted to Congress and approved in 1946. The congressional delegations from Arkansas, Oklahoma, and Kansas are solidly supporting the water projects in all three States in the Arkansas Basin. Organizations of civilian groups in the three States have worked effectively for many years in this field. Public support is at its highest peak. This wide area is fully ready for further development of its great water resources.

THE ARKANSAS BASIN DEVELOPMENT ASSOCIATION,
Tulsa, Okla., November 28, 1959.

Senator ROBERT S. KERR,
Chairman, Select Committee on National Water Resources.

DEAR SENATOR KERR: The membership of the Arkansas Basin Development Association is vitally concerned with the planning and construction of all sound water resource projects throughout the Arkansas Basin in Arkansas, Oklahoma, and Kansas. We fully endorse the aim of your important committee to bring the need for such developments into a proper perspective at the national level.

This association has been active for the past 15 years in supporting all proper efforts to achieve the earliest possible utilization of the resources of this area for the benefit of the people who reside therein and as a means of strengthening of our national economy and security.

For several years the views of the people in the Arkansas Basin in Kansas, Oklahoma, and Arkansas have been presented to the committees of the Congress by the chairman of a nine-man tristate committee. The Governors of each of these three States, Arkansas, Kansas, and Oklahoma, have appointed three men who are experienced in this field to the committee and they have been empowered to speak for the States. The present chairman is Mr. Clarence F. Byrns of Fort Smith, Ark.

The testimony which will be presented to your committee in Fort Smith by Mr. Clarence F. Byrns, chairman of the Tri-State committee, is completely in accord with the views of this association and represents in principal the unified thinking of our people with respect to the development of the water resources. We wish especially to emphasize the need for an earlier completion date than is now scheduled for the Arkansas River multiple-purpose project and the necessity of accelerating the bank stabilization work. A statement dealing in more detail with some aspects of our basin problems will be presented at the hearing in Oklahoma City on November 30.

We are in complete agreement with the concept that an adequate share of the national product should be set aside each year for capital investment in resource development. Future generations must have the all important water developments that we plan and build today if America is to maintain its leadership.

We commend your committee for the great efforts you are making to reach proper decisions that will so materially affect the long-range development of our water resources and assure you we will help in any way possible.

Respectfully,

VERSER HICKS, *President.*

Senator MCCLELLAN. Mr. Chairman, we would like next to call Mr. Arthur Ormand. Mr. Ormand is the present president of the Arkansas Basin Association and we will have following him some past presidents of this association.

I am sure you are familiar with the association because it is actually the driving power in this area for the development of this great resource of ours.

Mr. Ormand.

STATEMENT OF ARTHUR ORMAND, PRESIDENT, ARKANSAS BASIN ASSOCIATION

Mr. ORMAND. Senator Kerr, Senator Moss, Senator McClellan, I am Arthur Ormand, president of the Arkansas Basin Association, a segment of the river from Fort Smith to the Mississippi River.

We work in complete cooperation with the Arkansas River Basin Development Association of Oklahoma which is a part of the Mississippi Valley Association, Division 3.

Senator Kerr, at this time we want to pay special tribute to you for the major influence you have had during the past 20 or 25 years in the development of the Arkansas River. The progress we are experiencing today in its development would not be a reality were it not for you, your congressional delegation from Oklahoma. This applies to our own Senator John L. McClellan and his distinguished colleagues in the Senate and in the House.

We know very well that we would certainly not be where we are today if it were not for you two gentlemen who have led us and we want you to know up and down this river in Arkansas and in Oklahoma how we feel. We have told you this before and we like to emphasize it every time we get a chance.

We have in our midst also in the southwest division at Dallas, Tex., Gen. William Whipple, who has only been in that office a short time. He is an able and aggressive and competent engineer, very familiar with this Arkansas River project, and its problems.

We are to gain a lot from General Whipple since he came from the Missouri River to our district.

We are happy to have him at the present time leading us and the aggressive district engineers at Little Rock, Vicksburg, and Tulsa.

Our association in the past 20 years has been very active in the development of our comprehensive program on the Arkansas River. We secured the authorization of this project in the year 1946. You and Senator McClellan were there leading that.

We go each year before the House and Senate Appropriations Subcommittees seeking funds for the development of this river. We want to concur and approve the statement filed by our able Clarence Byrns, who makes our overall statements to our committees in cooperation with the Arkansas Basin development of Oklahoma. We all, as I have said before, and as you know, we all go right in there together. The last few years Clarence has presented this and there

is not anybody that can do it any better than Clarence and our committees appreciate greatly the way he has been presenting these things.

There is not anybody that knows any more about the Arkansas River than Senator Kerr, besides Clarence Byrns and Senator McClellan. We want to again emphasize and invite Senator Moss here—we want to add him now to the river celebration we are going to have when our river is navigable from near Tulsa to the mouth. You are looking at the co-captains there. This has already been arranged for years and planned. And the first boat that goes down that river officially will be an excursion boat. We have funds in the process of being raised. I don't know just exactly how much it is going to take, but we do want farmer Bob Kerr up there and Senator John right there at the helm of this boat.

Senator Moss. Sign me on.

Mr. ORMAND. And we are going to really have a celebration they will hear in New England and the northern part of the United States and even on the west coast and in California.

Senator Moss. Very good. I accept.

Senator MCCLELLAN. Is Mr. Harold Snyder present? Yes. Come around, Harold. I didn't see you.

Mr. Chairman, it is my pleasure now to present Mr. Harold Snyder, one of the past presidents of the Arkansas Basin Association.

STATEMENT OF HAROLD SNYDER, PAST PRESIDENT, ARKANSAS BASIN ASSOCIATION

Mr. SNYDER. Thank you, Senator. I was back where I could see Oklahomans, Senator. I was back there watching those people.

Senator MCCLELLAN. I could not see you. I was looking all around. You are not going to let them infiltrate too much.

Mr. SNYDER. Right.

Senator Kerr, Senator Moss, Congressman Trimble, this is an honor to have this committee come here in our midst and hear our comments.

First, perhaps I should tell you other than the Arkansas Basin I am a member of the Tri-State Committee, member of our State Arkansas Water Conservation Commission, and I make my living, such as it is, as president of Arkansas Valley Industries, an organization which operates in some 20 counties up and down the river producing poultry and livestock.

I would like to speak on just a little different angle. The other day the committee from the House of Representatives happened to be at Dardanelle and happened to have lunch at our home and they seemed to be interested particularly, some members of that committee, in what this program could do for other parts of the country. Being businessmen and most of us members of some chamber of commerce, I think probably the most embarrassing question we have ever had when appearing before your committees in Washington was how could we reconcile a request for this much money when our national chamber of commerce was asking for a cut in such expenditures or at least in the general budget.

What we would like for you to know is that we definitely do believe in economy and that as much as this would mean to us here immediately in the Arkansas River Valley, that we are hardheaded businessmen and that we would not ask this if we actually did not believe in it ourselves. But we feel that we can prove it and we think that that is why you are here and we are so glad you are, that you will find that this will be very definitely not only profitable but that it is a necessity for the welfare of the Nation as a whole and you can even carry it further to our national defense.

I would like for this to go in the record. Most of you have read it. The statements made in an interview the other day by Sir Charles Darwin and Joseph I. Spangler, whom all of you recognize as advisers to the heads of their nations and to the United Nations. They were asked how they felt about the 5 billion population that we are to have some 50 years from now. The question was stated this way: "Then you feel that food will be our biggest problem"? They first said "Yes." And then I believe it was Sir Darwin that said, "No, perhaps it will be water."

Fortunately, it is our contention here that we don't have to argue whether it is food or water, that when we have here this great undeveloped water resource and thousands of acres of land capable of producing food with sufficient water and transportation, that then as we develop the Arkansas River we are developing that food which this whole Nation and the whole world is going to need very, very seriously in the very near future. So that it is our contention that as much as we want economy in our Government, that this is an investment not only for us here in the valley, but for the whole world to produce food for ourselves and for our national defense in the future.

Thank you a lot.

Senator McCLELLAN. Thank you.

Mr. Chairman, I now am pleased to present Mr. Emmett Sanders of Pine Bluff, another past president of the Arkansas Basin Association. Mr. Sanders is from the lower valley, we may say, while the others here who have just testified may be regarded as from the upper valley as far as Arkansas is concerned.

All right, Emmett, we are glad to have you.

STATEMENT OF EMMETT SANDERS, PAST PRESIDENT, ARKANSAS BASIN ASSOCIATION

Mr. SANDERS. Gentlemen of the committee, as Senator McClellan just told you, my name is Emmett Sanders. I am a past president of the Arkansas Basin Association and currently serving as a member of the board of directors of that organization.

While this statement which I desire to present at this time deals solely with the area from Pine Bluff south to the mouth of the Arkansas River, a distance of approximately 125 river miles, the area within the jurisdiction of the Corps of Engineers, U.S. Army, at Vicksburg, Miss., as it relates to the overall plan, it is my belief that its contents can be expanded to include in varying degree the remaining sections of the entire area extending to Tulsa, Okla.

The problems discussed in this statement in my opinion are considered typical of the problems existing in the entire area. We are

discussing in the ensuing remarks some of the benefits which in our opinion will normally accrue within the scope of the present project as authorized. We are dealing primarily with the problem of water supply. However, we are of the strong opinion that we should give serious consideration to the importance of bank stabilization and flood control as a part of the program that concerns the people from Pine Bluff to the mouth of the river particularly.

This section poses the greatest engineering problem in the entire plan from a navigational standpoint. The river follows a meandering course through hilly, alluvial soil, creating a problem of caving banks. We think it appropriate and timely that we provide adequate appropriations on a permanent basis in order that this phase of the program can be put on a schedule that would complete bank stabilization prior to the closing of the dammed-up stream. We are not advocating any additional study or any expansion of the authorized project that might call for an additional study which could possibly have the effect of delaying whatsoever its construction. On the contrary, we urge construction as rapidly as economically feasible in order to obtain the benefits inherent therein.

Economists estimate that approximately 300,000 acre-feet of storage should be set aside in the proposed project on the Arkansas River below Pine Bluff for the purpose of providing up to 300 million gallons of domestic municipal and industrial water daily. Whether this water is to be released in the Arkansas River, and later withdrawn downstream for some economic use, is a matter to be resolved by the engineers from an economic standpoint. It is estimated that a cost of $6.50 per acre-foot could be justified for irrigation of pasture and crop lands, $14 per acre-foot for industrial and other use. We understand that very little cost would be added to the project to provide the water estimated to be needed in 10 to 50 years after the project is completed if desired at that time.

We are simply pointing out in this statement this project creates the source of supply which in later years can be utilized if the need is found to exist and can be justified.

It is estimated that 200 million gallons of water will be needed for industrial use in the vicinity of Pine Bluff, Ark., 10 to 30 years after the project is completed. The Pine Bluff area, because of its geographic advantage, railroads, and highways, is growing very rapidly and will continue to do so if a dependable supply of domestic, municipal, and industrial water can be provided.

The only answer to water storage in the Arkansas River navigation project, locks and dams on the project when completed should have enough extra water stored to supply 300 million gallons of water daily year in and year out.

Following the suggestion of economies and being governed somewhat by experiences from other similar projects, we make the claim for a minimum of $600,000 benefits annually from industrial and other water supplies.

It is estimated 100,000 people will visit the area each year for boating, swimming, hunting, fishing, and so forth. It has been estimated in some areas such visitors will spend as much as $8 per person daily.

Using the figure of only $1 per person it will produce annual benefits from this source of $100,000. Speaking in a general sense, the Pine Bluff area in southeast Arkansas, along the Arkansas River has a

geographically secure position in the Nation. Great forests of pine and hardwood timber exist, cotton and all agricultural crops flourish in the area. Few places in the Nation are as close to so many raw materials.

With the knowledge that a modern year-round 9-foot navigation channel exists, coming up the Arkansas River from the Mississippi River to Tulsa, Okla., there is nothing to keep this location from being the focal point of an enormous industrial expansion provided a dependable amount of industrial, municipal, and irrigation water can be supplied.

The area has good industrial-plant sites available for industrial use. These lands have easy access to natural-gas mains, capable of supplying gas in the millions of cubic feet daily. This area is also traversed by electric transmission lines of Arkansas Power & Light Co., capable of supplying all power needs; ample rail and highway facilities are available.

Thank you, gentlemen.

Senator McCLELLAN. Thank you. Mr. Chairman, I think Mr. Sanders has put his finger on something here that our Corps of Engineers should give very serious attention to, and that is in the planning of this overall navigation project that they do take into account and make accommodations for as much industrial water as it is possible to do from the amount of water that we have.

Mr. SANDERS. Thank you, Senator.

Senator McCLELLAN. I think it is a very pertinent observation.

The CHAIRMAN. And timely.

Senator McCLELLAN. We appreciate it being called to the attention of this committee. It is something I think we in Congress, as we hear further testimony before our committees out there and make appropriations particularly for this project, ought to take it into account.

Our next witness is Dr. Leslie Mack. Is Dr. Mack present?

I beg your pardon. I am very sorry. I overlooked one at this point.

The next witness is Mr. Boyd Ridgway, executive vice president, Little Rock Chamber of Commerce.

Mr. Ridgway, would you come around please, sir? I beg your pardon, sir. I had marked one in advance here as I made my notes.

Come around, please, Mr. Ridgway.

STATEMENT OF BOYD RIDGWAY, EXECUTIVE VICE PRESIDENT, LITTLE ROCK CHAMBER OF COMMERCE; AND EXECUTIVE DIRECTOR, THE ARKANSAS BASIN ASSOCIATION; DIRECTOR, THE MISSISSIPPI VALLEY ASSOCIATION

Mr. RIDGWAY. Thank you, sir.

The CHAIRMAN. When I saw that handsome gentleman here I though he must be from Oklahoma.

Mr. RIDGWAY. Thank you, sir.

Senator McCLELLAN. All right.

Mr. RIDGWAY. Gentlemen, I am submitting 25 copies to Mr. Schad for use in committee work at a later date.

My name is Boyd Ridgway. I appear in a dual role. I am executive vice president of the Little Rock Chamber of Commerce, and executive director of the Arkansas Basin Association. I am also a director of the Mississippi Valley Association and have had 10 years experience in economic development work, including 8 years on development projects within the Mississippi Valley.

We sincerely appreciate the opportunity to appear before this important committee. Obvious recognition by the U.S. Senate of the need for developing our water resources and the possible impact on development of our great country's natural resources has caused me to give considerable thought to this opportunity to testify before the U.S. Senate select committee.

Since Mr. Byrns has presented the general statement in behalf of the Arkansas Basin Association, I will confine my remarks to two basic points; namely, the economic and geographic impact on the development of the Arkansas River Basin and the pressing need of the bank stabilization and flood control facets of the overall project.

In a recent issue of U.S. News & World Report (November 9, 1959), based on "high level" population estimates, the States of Arkansas and Oklahoma are the only two States in the Nation forecasted to have no population gain at all in the next decade. While not being able to determine the economic area of that area of Kansas involved in the Arkansas Basin, my general knowledge of the area leaves me to believe that it will lose population unless plans are accelerated to complete the Arkansas Basin project.

Further basic data to substantiate the need for primary recognition of the Arkansas Basin development schedule is the one statistic that, in my opinion, cannot be distorted—but depicts in cold, stark reality void of inflationary distortion, the actual economic position of this area. Table 405 of the Statistical Abstract of the United States for 1959 (p. 314) outlines, by percentages, what portion of the total national income at various calendar periods each State possesses.

The following details have been extracted from that table:

Total personal income

[Percent of continental United States]

	1929	1950	1957
Arkansas	0.66	0.68	0.59
Oklahoma	1.26	1.11	1.07
Kansas	1.16	1.17	1.11

I am going to leave my printed testimony and inject one thing, sir.

There is an amazing peculiarity in American economics of which I am sure you gentlemen are aware, that market creates market and particularly since the end of World War II when you had an intensive increase in the cost of distribution of goods it has accelerated development of large urban centers and large markets like Dallas, Tulsa, Oklahoma City, and so forth. These cities, once landlocked in the midcontinent like Tulsa, grew primarily because of the impetus of the oil industry. We have not had that directly in the basin. This factor has helped develop these large cities.

Our American economy thrives on centers where all phases of transportation are complete; releasing our landlocked cities for economic

development by development of navigation on the Arkansas River will make all phases of national and regional transportation highly competitive. Then we, too, can develop an intensive regional consumer market. We, too, will have every basic economic need and natural resources to attract investment capital, to create new job opportunities and new wealth.

You two gentlemen are aware of this. Senator Moss, a good example of what I am referring to is this: About 90 miles from here is a town called Russellville, Ark. It has abundant coal with high B.t.u. content, almost 15,000 B.t.u. per ton. It has natural gasfields. It has timber. It has good surplus labor. The people are crying for year-round jobs. This stuff is landlocked at this moment.

When you combine all those with river transportation, making all your transportation competitive in that area will be just as important from the development of natural resources as the Ohio River Valley is right now. It is all there but it is landlocked.

You can create new jobs and wealth, and income for the total gross national product. I think this deserves consideration.

Mr. Snyder remarked what can this area do for the rest of the United States. It can create new taxable wealth when it is released and no longer landlocked.

Gentlemen, these three States are losing ground in the economic battle of survival. Furthermore, in talking with governmental and private market research officials, this trend is continuing and intensifying, and will continue to do so, unless drastic measures are rapidly enacted.

In my opinion, based on 10 years of economic development work, this forecasted trend can be sharply altered by expeditious consideration of the completion schedule of the Arkansas Basin.

The Arkansas Basin can become a thriving important market—a producer of economic wealth—if consideration is given to this appeal.

Secondly, since the decision by the Corps of Engineers to retain the Arkansas River in its natural channel, rather than altering the channel, has been finalized, it is felt that additional emphasis should be given to bank stabilization and flood control measures that must necessarily be completed prior to the closing of upriver dams.

I would like to get off this statement again for Senator Moss' benefit.

General Whipple has shown us one of the necessities for nature to do a lot of work instead of high-cost human labor and machines. If we get the bank stabilization done downstream in the flood control portion of it before we close the upriver dams, water will scour out the channel and dump the excess silt on both sides and stabilize the banks naturally.

If this portion of the work can be done now and on an integral portion of the total project, there will be tremendous savings. Those official records and economic data have been presented to your committee, the subcommittee on this project. But this to me is of tremendous importance on expediting the total project, and saving money at the same time.

Substantiating data has been recorded with the appropriate committee in Congress verifying that tremendous savings can be accomplished by expediting these phases of the overall project.

In summary, by completing the Arkansas Basin project as rapidly as possible, fearful forecasts of further population losses and further depression of general economics within the area embraced by the Arkansas Basin can be sharply improved—in a manner that will allow development similar to that presently occurring in the Ohio River Valley.

A vital factor in completing the total project within the Arkansas Basin is recognition for the need of establishing simultaneous funds for undertaking necessary bank stabilization and flood control matters, in order to take advantage of financial savings, in considerable degree—and in the shortest time feasibly possible.

Gentlemen, it has been my pleasure to appear before you and we welcome you to Arkansas, Senator Moss.

Thank you.

Senator McCLELLAN. Thank you, Mr. Ridgway.

Mr. Chairman, I think you are getting some facts in this record that are going to be very helpful to us in the future when we undertake to persuade our colleagues up there and we inform them as to what the realization is and make them understand that this is not just an Arkansas and Oklahoma project but it is something that is vital to the productive capacity and to the wealth of our Nation and to the strength of our entire national economy.

All right.

Our next witness now: Is Dr. Mack here?

Come around, Doctor.

Dr. Mack, Mr. Chairman, is with the, I believe Arkansas Industrial and Development Commission.

Mr. MACK. No, sir.

Senator McCLELLAN. No? All right, Dr. Mack. You take the seat and you tell us the whole story.

The CHAIRMAN. He works with that commission and is a very able ally of that commission as I understand it but not identified officially with it; is that correct, Doctor?

Mr. MACK. Yes, sir.

Senator McCLELLAN. All right, Doctor.

STATEMENT OF LESLIE MACK, GEOLOGIST

Mr. MACK. My name is Leslie Mack. I am a water geologist residing in Little Rock, Ark. Before I proceed with this statement, I think it only fair to you for me to explain my position here in the water resources field. Mr. Winthrop Rockefeller, understanding the tremendous importance of water resources as a cornerstone for the State's balanced growth, has asked me to come to Arkansas for approximately a year to initiate a long-range program for the development and conservation of water. The work is being sponsored by a grant from the Rockwin Fund.

In this capacity, since last June, I have been working with representatives from various State and Federal water active agencies. This project has the wholehearted approval of the Governor. I might add that the response to this work by the State and Federal agencies has been most gratifying. My testimony is given as a private citizen who is not representing any group or individual, either private, State,

or Federal. Consequently, my opinions are my own and I alone shall be held responsible for them.

There are two words that you shall hear repeatedly throughout this statement. They act as the framework for any water program—or for that matter, any long-range program. One of these words is efficiency. The other word is flexibility. It is my hope that this statement will show the need for these two words in your water resources vocabulary. I am aware that this Senate select committee has, or will have at its disposal, a mammoth collection of water facts and figures, numerous opinions, suggestions, and potential solutions. Therefore, I shall attempt to be as brief as possible and yet try to submit a meaningful statement.

Here in Arkansas we have formed a water resources planning committee composed of representatives from State agencies that have a primary interest in water. These include the Arkansas Geological and Conservation Committee, water conservation commission, State board of health, water pollution control commission, game and fish commission, industrial development commission, and the industrial research and extension center.

The purpose of the committee is to further develop and coordinate multipurpose water planning by State and Federal agencies. It is thought that unified planning by these agencies will increase the efficiency of water use and conservation.

In order to accomplish our task, we must first acquire a number of water management tools. I use the words "water management" rather than "water control" in order to imply flexibility for optimum use of water. Water management tools are an assortment of analyzed data which one must have to utilize water most efficiently for its myriad uses. We must know, for example, the intensity, frequency, and distribution of precipitation.

The U.S. Weather Bureau provides invaluable data here. As the precipitation collects in valleys and starts its oceanward journey via streams and rivers, we must know discharge characteristics from point to point downstream. The U.S. Geological Survey's Surface Water Branch has compiled stage-discharge data for most Arkansas rivers and major tributaries but the important continuity of stream-gage records and new records from other tributaries have been hampered by lack of funds. From stream-gage records come a number of water management tools. Flow duration curves indicate the discharge that can be expected during any percent of a given period of time. Low-flow frequency curves indicate the length of time that a given discharge can be expected. Flood frequency curves are self-explanatory.

To put this in practical terminology, these management tools are necessary to provide engineers with the knowledge for proper design of roads, bridges, dams, and for the location of buildings, water supplies, and for pollution dilution, and so forth. How many millions and millions of dollars have been lost because we did not know what a river could do? Adequate surface water records permit flexibility and efficiency for design.

Ground water data are equally important. Those data can furnish a number of management tools. How far beneath the surface is the ground water? What direction is the ground water moving? At what rate will the water-bearing stratum—aquifer—yield water?

How thick is the stratum? What is the hydraulic connection, if any, between saturated strata? How much water is in the stratum? What percent of this water is available? What is its temperature and what are the quality interrelationships? Most important and least understood is the rate at which ground water is being recharged and where this recharge is taking place. Many of these questions can be answered for some specific areas but for the greater part of Arkansas, and certainly much of the United States, many of the answers are missing. The data are being collected and analyzed by the U.S. Geological Survey's Ground Water Branch which, like the Surface Water Branch, has a cooperative program with the Arkansas Geological and Conservation Commission under the able direction of Mr. Norman F. Williams.

Another set of water management tools is provided by water quality data. In its broadest sense, these would include records of floating, suspended, and dissolved organic and inorganic mater. The State board of health's bureau of sanitary engineering and the Arkansas Water Pollution Control Commission, capably administered by Glen Kellogg and Marvin Wood, respectively, maintain an active program. The U.S. Geological Survey's Quality of Water Branch has a cooperation program with the University of Arkansas for the collection, evaluation, and publication of basic data on the chemical and physical quality of surface and ground waters.

As the cost of pristine pure water is prohibitive, pollution management must flexibly maintain a safe balance between the assimilation characteristics of rivers and the amount of treated and untreated used water discharged into them. This is to say that water containing pathogens, organic and inorganic compounds and complexes and excessive radioactivity that is harmful to desirable forms of life must be treated but it would be most impractical to require that all water be treated that is used for any purpose.

Topographic mapping in Arkansas is very inadequate. This management tool is not only basic for water resources planning but also is necessary for many other endeavors.

There are two other rather obscure but extremely important water management tools. One is the efficient and flexible organization for the local, State, and Federal administration of water resources. This would include water law.

I am not prepared to delve into this massive subject at this time but it is worthy of your most serious consideration. The other, and I can't stress this enough, is the need for public education concerning water resources. I am certainly not asking that all people become water experts; however, a basic understanding of water behavior by the public would increase the efficiency of water management immeasurably.

This, briefly, has been a discussion of some of the tools for water management and why they are necessary for the efficient use of water. Flexible manipulation of water quantity, quality, and distribution within the limits of our water resources is necessary.

Think for a moment how much easier water management would be if State and county boundaries were coincident with major and minor drainage divides instead of where they are. To change our present boundaries would, of course, be absurd but I make this statement to illustrate the complexity of the subject. Here is another example.

A water molecule landing in northwest Montana from a drop of rain is subject to water laws of 13 States and the Federal Government as it makes its way down the Missouri-Mississippi River systems en route to the Gulf of Mexico. This is providing that the molecule is not lost back to the atmosphere first which would really be the normal course of events.

Because of the magnitude of the area in the United States, the wide variations in rainfall and runoff, and the variety of vital uses of water, it is evident that it is in the national interest that the Federal Government be involved with water resources.

A tremendous increase in Federal activity concerning water resources during the past hundred years has shown the need for Federal participation. In addition, there has been a distinct trend in the past few decades, especially in the last few years, toward the realization of multipurpose water projects. This is a logical move. Recent legislation has wisely implemented this trend. I refer, for example, to the Water Supply Act of 1958 and the Watershed Protection and Flood Prevention Act.

I trust that future legislation will follow this unifying principle of multipurpose projects even though all uses may not require immediate need. Increasing water requirements and decreasing storage sites necessitate the greatest amount of present and potential water use efficiency. As a final point, it is evident that there is a need for Federal participation in water resource development and conservation.

If then, there is a trend away from water projects which are limited in scope toward realistic, efficient multipurpose water projects, shouldn't there be a realinement in Federal agency duties and responsibilities that would reflect these multipurpose concepts and be in keeping with governmental efficiency?

The Arkansas-White-Red Basins Interagency Committee report of 1955 is a monumental compilation of water and water-related facts and planning. Much good work has been done and this should neither be lost nor ignored. It is my hope that this guiding framework can be filled out by cooperating State and Federal agencies as it has been in the past.

This brings forward another point. There is a great need for closer State-interstate-Federal coordination for water resource planning but I firmly believe that water management should remain on an interstate and intrastate level. In order for this to happen, the Federal Government must firmly define its policies but allow sufficient flexibility for adoption by the States. Wide hydrologic variations between States makes this mandatory.

As a water geologist, I strongly emphasize the need for hydrologic research which will bring about greater water use efficiency and management flexibility.

As a final word, I join my fellow Arkansans by endorsing our river basin programs and trust that they will be kept in balance with other water resource projects.

Thank you very much.

Senator McCLELLAN. Thank you very much, Dr. Mack.

Mr. Jim Kurz, will he come around, please?

Mr. Chairman, Mr. Kurz is with Dierks Industries.

All right, Mr. Kurz. Will you be seated and proceed, please, sir?

STATEMENT OF JIM KURZ, DIERKS PAPER CO., ON BEHALF OF THE COMBINED PULP AND PAPER COMPANIES IN ARKANSAS

Mr. KURZ. Gentlemen of the committee, my name is Jim Kurz and I am with Dierks Paper Co. This is the report of the combined pulp and paper companies in Arkansas. Three of the paper companies doing business in Arkansas, three out of the four, have representatives at this meeting.

This is just a short oral report and the long written report has already been turned in to the reporter.

Senator MCCLELLAN. I assume that written report will be made a part of the record.

Senator MOSS. It will be a part of the record at this point.

Senator MCCLELLAN. Thank you, Senator. Proceed.

Mr. KURZ. The pulp and paper companies operating in Arkansas are producing some 2,200 tons of paper per day. We employ some 4,800 persons in manufacturing, converting, and woodland management activities. There are some 5,200 employed by others in Arkansas in the conversion of their products, in procurement of the wood or fibrous raw material for this quantity of paper. The direct employees of these companies receive salaries and wages of over $28 million annually. The converters and wood suppliers receive over $32 million annually. The total economy contributed by the industry to Arkansas is over $60 billion annually by some 10,000 wage earners.

Looking toward the future and the year 1980, the paper industry will expand both in production and in the conversion of its products within the State. By 1980, our production will be at least 6,000 tons per day and will employ a total of 20,000 people in supplying, producing, and converting; with a corresponding increase in wages. This increase will come gradually between now and 1980. These are the estimates of present producing pulp and paper mills and the one producer who has announced definite immediate construction for additional production. Undoubtedly, other enterprises will enter into this field of industry between now and 1980.

Other than the fibrous raw material, wood, or wood waste products, water is by far the most important raw material. It is used by the industry as a carrier of pulp and chemicals, a washing media, a cooling media, a heating media for the production of steam, a drying media, and a motive force, as well as for the usual sanitation and drinking purposes. The total usage of water within a given mill is between 20,000 gallons per ton and 40,000 gallons per ton depending on the end product of the mill. The total of the industry in Arkansas requires some 74 million gallons of water daily. This is presently split at 14 million gallons of surface water and 60 million gallons of ground water.

This usage of water by the industry is expected to increase to 220 million gallons daily by 1980. Only 45 million of this is expected to be surface water. The remaining 175 million gallons daily will be ground water. The preponderance of ground-water usage proposed for 1980 is undoubtedly due to lack of confidence by the present producers in having available a high quality surface water which can be obtained and treated as economically as ground water. This reliance

upon ground-water supply may cause a serious lowering of the water table in the southeast section of Arkansas.

Practically all water used by the pulp and paper industry must meet certain minimum quality standards as regards color, hardness, chloride, and total solids. (The stricter the water-quality requirements imposed, the higher the quality of product which can be produced.) The overall quality of Arkansas paper will continually be improved. The greater part of all water used by the industry is presently treated for color removal, hardness lowering, complete demineralization, or a combination of the three.

The present cost of water is between $1.25 and $1.75 a ton of paper production. This includes depreciation of equipment for gathering, treatment, and distribution; repair of this equipment; and the cost of chemicals and labor for treatment. In other terms, it means a total cost of $50 per million gallons of water used. If complete demineralization is required, this cost approaches or exceeds $500 per million gallons. The future costs of water should not greatly exceed the present costs and should remain in the same proportion with the continuation of inflationary times. The industry will require and demand as good or better quality of raw water as is presently being obtained. Cost and quality standards of water must be kept in line, otherwise the area will not receive the developments in the pulp and paper industry to which its potential of forest resources entitles it.

Since the industry is an important user of water, we are interested in pollution control and the various legislative bodies which enact laws and rules that regulate it.

We know that regulations and controls on waste products must be strict enough so that water available to us will be of such quality as to allow us to treat it at a reasonable cost. We also know that our waste materials should not be of such quantity and character as to render the receiving stream unfit for downstream municipal and industrial use, and for aquatic life environment. The present rules and regulations as set forth by the Arkansas Water Pollution Control Commission are reasonable and workable. It is felt that the State commission should be the regulating body within a State. A River basin agency should be formed by the States within a given river basin and should coordinate the regulations between States. No one set of regulations can satisfactorily govern pollution control for all river basin agencies.

The paper industry is the third largest user of water in the United States, being exceeded in its use of water only by the basic metal industry and the chemical industry.

Most water is reused at least 25 times and usually 40 to 50 times before being disposed to the sewer or outfall. Over 90 percent of all water taken into a mill is replaced either into the earth or into streams. Less than 10 percent is lost through evaporation; so our ultimate use or loss of water is very little.

In the past 15 years, the total waste materials lost through mill effluents have decreased 50 percent per ton of paper production. This reduction has been largely due to technological research by the industry contributed by the Institute of Paper Chemistry, National Council for Stream Improvement, Inc., and other organizations sup-

ported by the pulp and paper industry. Also contributing to this reduction are improvements of equipment by machinery suppliers and the concentrated efforts of management and labor in operating this improved equipment in the most economical way.

It is believed easily possible for these waste materials to be further reduced by at least 50 percent before 1980 through the efforts of research, design, management, and operation.

The paper companies are not only interested in the water supply for manufacturing purposes but are also keenly aware that the continued growth and supply of our fibrous raw material depends upon water, either in the form of rain or through irrigation. The continued and ever-increasing demand for fibrous raw material will bring about more research by our foresters and other agencies. This research will be directed toward fuller utilization of trees and higher yields per acre through good forest practices, probable fertilization, and proper application of water.

The paper companies, usually being large landowners, are in effect sources of water above their own requirements in that the runoff and seepage of rain from their lands will exceed their water demands. Because of this, we are immensely interested in all projects, either private or public, which will aid in conservation, pollution abatement, transportation, power, industry, and recreational facilities. We believe that these works or projects should be controlled in such a way that none will be hurt by regulations set forth by either the State or Nation.

Sufficient water should be turned loose from upstream reservoirs, in times of drought or water shortage, to more than take care of the water demands downstream so as to minimize effects of stream stagnation.

In conclusion, we feel that the resolution of the 86th Congress, which instigated this committee's study, is a farsighted one that will lead to the strengthening of our Nation through conservation planning for better and greater utilization of our resources.

We would like to caution against the favoring of any of the manifold purposes of water utilization which might cause detriment to others and constitute loss to all our citizens.

This report is for the Crossett Co., Dierks Paper Co., International Paper Co., and Potlatch Forests, Inc.

Thank you.

Senator McClellan. Thank you, Mr. Kurz.

Senator Moss. Mr. Kurz, I noticed that you say that it is expected that you will be using 220 million gallons of water daily by 1980 and that this must come mainly from ground water. Has your study indicated any means of recharging the ground water so that that much can be taken out by that time?

Mr. Kurz. Actually, we have some other men who are a little better prepared. The big thing is if we can get, say, dams on this Arkansas River Basin and keep a steady flow in the river, then that would tend to recharge the underground supply.

Another thing, there is just one company—it is in the written report—that is planning on taking surface water. Maybe surface water will be available to some of the other companies.

Would you like to comment on that, given a little statement on that?

Statement by Combined Pulp and Paper Companies in Arkansas

(Submitted by John L. Oswalt for the Crossett Co., Dierks Paper Co., International Paper Co., Potlatch Forests, Inc.)

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STATEMENT OF FRANK DUGAN, ENGINEER, INTERNATIONAL PAPER CO.

Mr. DUGAN. I am Frank Dugan, engineer with the International Paper Co.

I am familiar with the water problems in Arkansas and Louisiana. We feel that if the water quality standards of the Arkansas River are raised considerably as a result of the building of the upstream impoundments and the leveling off of the chloride content of the Arkansas, it is quite possible that as our future demand for water increases at Pine Bluff that we will be able to go to the Arkansas River as a source of water supply. We hope so. We are counting on it. Of course, if that is not the case, it is quite possible that we will have to expand our ground water requirements.

Do I answer your question, Senator?

Senator MOSS. Yes, I think you do, in the main. The amount here was such a tremendous increase and since the witness indicated that most of the source would be ground water, it immediately raised the question in my mind as to whether or not that much ground water could be taken out.

Mr. DUGAN. I see, sir. That question will have to be answered in future years as the wells are drilled and the demand is put on the aquifer. We will just have to see what the drawdown is and whether it will stand it. If it won't stand it, obviously we will then have to either curtail our water use or go to surface supply.

Senator MOSS. Surface water?

Mr. DUGAN. Yes.

Senator MOSS. Thank you.

Senator MCCLELLAN. Mr. Chairman, the next witness is Mrs. Swartz, of Fayetteville. Mrs. Swartz, sit down, please.

Mrs. Swartz is vice president of the Arkansas League of Women Voters.

STATEMENT OF MRS. DELBERT SWARTZ, VICE PRESIDENT, ARKANSAS LEAGUE OF WOMEN VOTERS

Mrs. SWARTZ. Senator Kerr and Senator Moss and Senator McClellan, the League of Women Voters of the United States has been studying water resources for 4 years. We support those national water policies and practices which promote coordinated administration, equitable financing, and regional or river-basin planning. The League of Women Voters of Arkansas plans to publish early in 1960 the reports of their studies of the Arkansas, White and Red River Basins.

I am Mrs. Delbert Swartz, first vice president of the League of Women Voters of Arkansas. I am reporting for Mrs. William G. Reese, chairman of water resources.

There are eight local leagues in Arkansas. We have a membership of somewhat over 500.

Arkansas is blessed with an abundance of water from rainfall, streams, and springs. In our State, the most important problem is to make the best use of abundant resources—people, land, and water.

The White River drains the Arkansas-Missouri Ozark Plateau and flows southeastward into the Mississippi River below Helena, Ark.

The White River is the least polluted river in the State. It is fed by abundant rainfall and springs and it originates in hard bedrock areas which are forested. The upper reaches of the White River are well suited to multiple-purpose dams because of the hilly terrain in the Ozark Plateau. Some of the larger dams in the White River Basin are Bull Shoals, Norfolk, Table Rock, and Beaver, a dam which is at present under construction.

Because these dams control the White River so well above the confluence of the White and Buffalo Rivers, many conservation-minded persons oppose the construction on the Buffalo River of dams which would block the last free-flowing river in the State. The proposed Lone Rock and Gilbert Dams are considered detrimental from the sportsman's point of view and an esthetic viewpoint, also. The dams on Buffalo River seem to be unnecessary because of the adequate control of the White River in that general area. Conservationists believe that other methods can be effective for flood control on the Buffalo River.

Another project which should be carefully evaluated is the proposed Wolf Bayou Dam to be located upstream from Batesville. Some of the objections to this dam are the necessity of relocating the railroad that follows the river for some distances and the flooding of industries that cannot be relocated. I refer in that case to the inundation of thick layers of high silica-bearing sandstone.

Many persons urge that the proposal to build Wolf Bayou Dam should be most carefully considered. Floods in the lower reaches of the White River remain a serious problem. There is need for improvement of the drainage ditches to prevent recurring damage to valuable fields.

Water pollution and floods seem to be the main problems of the Arkansas River Basin. Forms of pollution are silt, sewage, industrial wastes, and salinity. Some of these problems have their sources in Colorado, Kansas, or Oklahoma, through which the river flows. The people in this river basin are well aware of the need for coordination within and between Federal, State, and local agencies and the need for regional or river-basin planning for conservation of water resources.

In Arkansas the construction of Dardanelle dam and lock will provide for the generation of power as well as the storage water for navigation and power. Pollution in the eastern section of the Arkansas River prevents its adequate use for recreation and other purposes. This situation is expected to be alleviated by improvements in pollution control.

The Ouachita and Red Rivers in the southern and southwestern part of the State have common problems which include pollution, floods, and lack of recreational facilities. One city in the region, Magnolia, faces a serious local water problem. Its sources of well water are rapidly receding; in fact, they have receded 150 feet within the last 30 years and they have depended upon wells for their source of supply. Surface water is difficult to obtain at reasonable cost. This local problem has created much interest in the broader problems of water resources.

Through their studies of the river basins of Arkansas the members of the league have become aware of the extremely complex problems in the field of water resources. The league supports the Murray bill,

which is Senate bill 2549, the Resources and Conservation Act of 1960. We believe that it will be helpful in formulating improved legislation in the water resources area. The executive council and joint committee authorized by the Murray bill to study and report means of coordinating programs might also provide legislators fuller information on which to base water resource development evaluations. These reports also should lead to establishment of more equitable standards for financing and cost repayment.

On behalf of the League of Women Voters, I wish to commend the Senate select committee for its part in gathering information about the water needs of our Nation. I am sure that its recommendations will help in solving some of our problems in this area and will generate widespread public interest and support.

Thank you.

Senator McCLELLAN. Thank you very much.

Senator Moss. I would like to point out that this excellent report by the League of Women Voters here in Arkansas is typical of what the League of Women Voters is doing all over the United States. Every hearing that we have held we have had an appearance from the League of Women Voters and in each local area they are doing excellent study work of this type. I certainly commend them for it.

(The statement of Mrs. Reese follows:)

STATEMENT OF MRS. W. G. REESE, LEAGUE OF WOMEN VOTERS OF ARKANSAS

MAGNOLIA'S WATER SUPPLY—HOW LONG WILL IT LAST?

WHAT IS THE SOURCE?

In the town of Magnolia our water wells are running dry.

In our main well which has a capacity of 875 gallons per minute the water level has dropped about 150 feet since 1928.

Recently five test wells have been drilled in various parts of the town at a cost of $10,000. No productive sand was found in four of them. A pump was installed in the fifth.

The test wells made show that the only area left for testing is that section southwest and west of the town. Wells located in this area would make piping and pumping expenses heavier. The section east of town outside the city limits has also been recommended for exploration.

Our well water is of fine quality.

HOW MUCH IS USED?

The average daily water consumption for 1957–58 was 788,327 gallons; maximum daily consumption was 1,493,300 gallons.

According to a March 1959 report of a survey made by Marion Crisp, consulting engineering, Little Rock, our need in 1970 will be about 1,200,000 gallons on an average day; and in 1989 (anticipated population 20,000) 2 million gallons on an average day with a maximum of 4 million gallons daily. These are minimum figures. This amount of water would be sufficient provided no big industrial users move into the area.

Present users for the period Apr. 5–May 5, 1959

Residential accounts	13,335,000
All other accounts	9,059,600

The amount of water used in the water injection programs in the Atlanta, Haynesville, Magnolia, Stephens, and Village oilfields during 1958 was 427,977,438 gallons of water. Some 234,494,576 gallons were fresh water, 193,482,352 gallons were salt.

WHAT CAN WE DO?

It has been recommended that there be more geological study of the Sparta sand in the town vicinity and more test holes made to seek well sites.

The Corps of U.S. Engineers is studying the possibility of a dam or series of dams on Dorcheat Bayon west of Magnolia. This project is for flood control, but it could include water supply.

Impounding the fork of Smackover Creek east of College Hill community and approximately 1 mile north of highway 79 is a possible way to secure more water. Another way would be the impounding in the valley of Big Creek between Waldo and McNeil and north of the St. Louis-Southwestern Railroad track. A high dam (31 feet) here has been recommended by Mr. Crisp as the best possibility for obtaining surface supply.

WHAT CAN YOU DO?

Find out more about Magnolia's water supply.
Study possibilities for adding to our surface water supply.
Begin to think about future water needs.

Senator McCLELLAN. Mr. McGoodwin. Mr. Chairman, Mr. McGoodwin is from Fayetteville. He is secretary-manager of the chamber of comerce. I believe he will have a special interest in Beaver Dam.

STATEMENT OF L. M. McGOODWIN, SECRETARY-MANAGER, FAYETTEVILLE CHAMBER OF COMMERCE

Mr. McGOODWIN. I am L. M. McGoodwin, a consulting engineer of Fayetteville, representing the Fayetteville Chamber of Commerce, in the absence of Mr. Wesley Gordon, who could not be here.

The Fayetteville Chamber of Commerce first wishes to express its appreciation to this committee for the opportunity to present a statement concerning water conservation and water supplies of our area.

The chamber of commerce also wishes to express its appreciation to the Senate and to the Congress and to Congresman Trimble for its efforts and its success in getting Beaver Dam started.

I would like to read the introduction to our report and file it with you for your reading at your convenience.

Scientifically our report deals with our area instead of the entire broad water resources of the Arkansas River Valley.

During the last 10 years extensive studies have been made of the water supply and water resources of northwest Arkansas. The Fayetteville Chamber of Commerce is particularly concerned with the area of Washington and Benton Counties.

The population of the urban centers of the two counties is growing far in excess of the national average. Not only is the population growth phenomenal, but the water usage per capita has long exceeded the national average per capita. Today, water used by the cities of northwest Arkansas averages over three times the national average on a per capita basis.

These factors, coupled with the implied growing attrition to others of the rights of water which literally "flows from under our feet," causes great concern to the Fayetteville Chamber of Commerce and our sister organizations in all the cities of northwest Arkansas.

With these facts in mind, we present this report and urge that every possible safeguard be taken to reserve to our people our greatest natural resource—the water which falls on our hills and valleys.

WATER YIELD AND QUALITY

Here in northwest Arkansas we have one of the finest supplies in the Nation. The water is of excellent quality. Our streams flow clear. Our water is prized for its soft quality, no iron, sulphur, or other harmful minerals being present.

Water yield is adequate when taken on an annual yield basis. The average yield is approximately 18.35 inches per year. However, the annual yield varies greatly from a low of about 2.80 inches in 1954 to 38.37 inches in 1927. Long periods of drought, such as occurred from 1952 through 1956, make it imperative that our people conserve and store our water resources and protect our water rights from attrition by outside interests.

WATER DEMAND

A recent extensive study made by the University of Arkansas College of Business Administration, industrial research and extension center, in cooperation with the cities, chambers of commerce, and private engineers of northwest Arkansas, revealed some startling facts about past, present, and projected future water use in the area.

The recorded and projected use of the cities of Washington and Benton Counties of water through the year 2000 is as follows:

	Million gallons per day
1940	2.03
1958	6.85
1959	8.21
1970	17.0
1980	34.0
1990	68.0
2000	140.0

It is generally considered that the present national average water use is approximately 100 gallons per person per day. Water use in northwest Arkansas has long exceeded the national average, and is now three times the national average. Even in 1940 we were using 100 gallons per person per day. In 1959 we are using 300 gallons per person per day, and one of our cities is now using 350 gallons per person per day. This means that northwest Arkansas is now using three times as much water for domestic and industrial use on a per capita basis as the average of the whole population.

Not only are we using three times as much water per capita, but based on an extensive study by the responsible industrial research and extension center, it is estimated that, due to our great population growth and increased water usage per capita, we will be using 140 million gallons of water per day in the year 2000.

INDUSTRIAL GROWTH

The people of northwest Arkansas have long been noted for giving an honest day's work for their pay. Here we have good schools, one of the world's best recreation areas, and a temperate climate. These factors, combined with the industry of our people and one of the world's best and most adequate water supplies, are attracting industry in an ever-increasing volume.

Each year, with new industry being built and new jobs created in the area, more water is used. In 1957, the water use in one of our cities averaged about 1 million gallons per day. In 1959, water use will average 2½ million gallons per day. In a 2-year period additional industry was built in the community, which together with increased population, required 2½ times as much water.

Although this tremendous increase has not occurred in all of our cities, heavy increases have ben recorded in all.

WATER USE OUTSIDE AREA

The accompanying map shows the outline of Washington and Benton Counties, and the streams which drain this watershed. It is interesting to note that the "top of the watersheds" runs north and south through the two counties, and that the streams drain water to the north, east, south, and west. However, the most interesting feature is that every drop of runoff water is drained into reservoirs, only a small part being retained in the area for use by our people. It is this use of our water, and the dependence of outside interests on this water for their well-being that concerns us most.

Spavinaw Creek: A study of the map included herewith indicates that the water of the Spavinaw now flows into the river and lower Spavinaw Lakes. Tulsa has developed this source to its maximum economic capacity. The well-being and economic life of that city is dependent on the Spavinaw water. One hundred and forty-three sections, or approximately 37 percent of the drainage area, is in our two counties.

Little Sugar Creek: The northern section of Benton County is drained by the Little Sugar Creek. This water flows into Grand Lake and Lake Fort Gibson. Between these two lakes it is planned to construct Markhams Ferry Dam. When this structure is complete the waters of the Little Sugar will fall some 500 feet through the power turbines. Undoubtedly, some claim to at least a portion of these waters is made by the Grand River Authority and the Federal Government.

White River: A further look at the map reveals that the proposed Beaver Lake will take the waters from all of the White River watershed in our area. This water is to fall through Beaver, Table Rock and Bull Shoals Dams, creating electrical energy for the Southwest Power Administration. The 700 feet of usable head created by these dams makes the water very valuable. However, we in northwest Arkansas have great hopes that storage, specifically set aside for industrial and domestic use, will be provided.

The Army Engineers are considering the raising of the dam 5 feet above original plans to provide a total of 120 million gallons of water per day for industrial and domestic use. The cities of northwest Arkansas have indicated a willingness to share in the cost of this construction. In support of this proposal a two-county water conservation district has been formed, and commissioners named from Washington and Benton Counties.

The Fayetteville Chamber of Commerce wishes the record to show that it believes the inclusion of this additional storage in Beaver Lake is thoroughly justified and that it must be included if northwest Arkansas is to prosper in accordance with its natural resources.

Jones Fork Creek: The southern part of our area drains into Jones Fork Creek. The full economical development of this watershed has been utilized by the city of Fort Smith. Even now, we understand, Fort Smith is looking for other supplies which can be developed to meet its ever expanding needs.

Barren Fork Creek: Barren Fork Creek, which drains the extreme southwestern part of our area, flows into Tenkiller Ferry Reservoir, with the water being used for recreation and power in another State.

Illinois River: With the possible exception of the drainage area of the White, the people of northwest Arkansas are more concerned with the use of the water flowing down the Illinois River into Oklahoma. This river drains the heart of our land. Every one of our major cities, and most of our smaller communities, are wholly or partially built on the drainage shed of the Illinois. Most of them depend on this drainage area for their water supplies.

The waters of the Illinois already flow into Tenkiller Reservoir. It has been proposed that a second reservoir be built by the city of Tulsa at a site about 5 miles north of the city of Tahlequah. In a tentative agreement between representatives of the city of Tulsa and the Army Corps of Engineers, the city would allow 295 cubic feet per second, average flow, to pass on downstream to Tenkiller Reservoir. In addition to this flow, it is proposed that the city of Tulsa will provide firm storage from which it would draw approximately 230 cubic feet per second.

In order to store and use 230 cubic feet per second of water at the reservoir proposed by the city of Tulsa, an average input of at least 300 cubic feet per second would be required. This would mean that if the estimated requirements of Tenkiller and the proposed Tulsa reservoir were met, some 600 second-feet of the total average flow of 900 second-feet at the Tulsa Lake site would be required. This would leave only 33 percent of the total yield for other users in both Oklahoma and Arkansas.

If it is further assumed that other Oklahoma users are entitled to their percentage share of the remaining water, then only 23 percent of the total flow would be available to Arkansas, while Arkansas runoff is 71 percent of the total flow at the proposed Tulsa Lake site.

The Fayetteville Chamber of Commerce takes the position that a proper and just allocation of the waters of the Illinois must be made before users in any area are allowed to build facilities which would require water in excess of what is obviously just to all parties concerned. Surely, Arkansas is entitled to more than 23 percent of the total flow at the proposed Tulsa damsite, since it furnishes 71 percent of the total flow at this point.

An even more important consideration than the average total flow is the flow during periods of extreme drought such as occurred during the years 1951 through 1956. The total streamflow at the site of the proposed Tulsa dam during the water years of 1954, 1955, and 1956 averaged 323 cubic feet per second. During the 6-year period of 1951 through 1956, the total streamflow averaged only 560 cubic feet per second. Obviously, it would take a storage reservoir of major proportions to supply the net average 528 cubic feet per second of usable water required during long periods of drought, even if no water were taken by other users. This hardly seems in keeping with the fact that 71 percent of the total streamflow is Arkansas water.

SUMMATION

Northwest Arkansas, including Washington and Benton Counties, is experiencing a rapid population growth and an accelerated industrial growth. Water usage in the area is increasing at a rate far in excess of the proportionate increase in population growth and industrial activity. Water usage is already three times the national average on a per capita basis.

Northwest Arkansas has one of America's finest water supplies, both as to quantity and quality. Every drop of water which falls on the area, except that falling during periods of extreme floods, is put to profitable use, either for domestic, industrial, or agricultural use, or for the production of power. Most of this use is in areas other than the immediate area in which the water falls.

Much of this water has already been appropriated by out-of-State interests. While neither the Fayetteville Chamber of Commerce nor the cities of northwest Arkansas recognize the permanent rights of others to the waters of our area, certain claims, by implication, have been and are being laid to much of our water. In the absence of a legally approved compact between Arkansas and other States involved, we request that construction of additional facilities, outside of Arkansas, involving the use of our water be delayed until all rights have been established by mutual legislation.

Gentlemen, we thank you and hope you find our report profitable.

Senator McCLELLAN. Thank you, sir.

Mr. C. C. King, mayor of Eureka Springs.

Are you present? Will you come around?

Mr. KING. Mr. Trimble presented my statement. I want to thank you.

Senator McCLELLAN. All right. Thank you, Mr. King.

Mr. Charles Conway, president of the First National Bank of Texarkana, interested in Millwood Reservoir.

Is Mr. Conway present?

Mr. Conway? I don't know, Mr. Chairman. He may have sent a statement that he desires to file. If so, I would ask that it be filed.

The CHAIRMAN. Very good. If it is not here and if it will be sent, we will be glad to include it in this record.

Senator McCLELLAN. Thank you, sir. Mr. Joe Robinson, of Springdale. Mr. Robinson, will you come around, please?

Mr. Chairman, I would think Mr. Robinson is particularly interested in Beaver Dam.

Mr. Robinson.

STATEMENT OF JOE ROBINSON, PRESIDENT, BEAVER DAM ASSOCIATION

Mr. ROBINSON. Senator Kerr, Senator Moss, our own beloved and appreciated Senator McClellan, our own beloved and appreciated Congressman Jim Trimble, a man whom we in northwest Arkansas look to for leadership at all times.

Ladies and gentlemen, I come before you today to principally tell you how much we appreciate what you gentlemen are doing for us. I come as president of the Beaver Dam Association.

We are sorry today that Earl Harris passed away a short time ago, our former president, a man who had done much for Beaver Dam and who would so have liked to have been here this date. I come as vice chairman of the Arkansas Game and Fish Commission, who are vitally interested in Beaver Dam.

Senator Kerr, you will be very much interested in this. I come as a member of the Oklahoma Anti-Horse Thief Association, who I understand until a very short time ago had quite a lot of work to do.

While possibly the octane content of your gasoline might drop down occasionally, we are in no wise concerned with your product, sir.

Last but not least, I come as an ordinary American citizen who appreciates the things that this country has to offer us.

Senator Moss, since you are so far from home, I would like to say a word that might make you feel more welcome here in Arkansas. We know you have much natural beauty in your State. We know you have fine deer hunting. We know you have many oil wells. We know you have much uranium. We know you produce a lot of pinto beans which are consumed here in Arkansas. But we also believe that we have the finest water resources, if properly developed, of any State in the Union. I would be unkind to you if I failed to tell you that the trucking industry in northwest Arkansas especially appreciates the liberal trucking laws which we enjoy when coming into and passing through the State of Utah and without being unkind, this is more than I can say about a gentleman who you see in the papers occasionally that has a hole in the bottom of his shoe. Several years ago he had done the trucking industry in his State an injustice and he hasn't gotten over it yet.

Beaver Dam Association was formed in 1949, and in February of that year we appeared at the first public hearing. I was happy to be at the hearing. It was at Newport when Beaver Dam was first talked about publicly. There was no opposition to Beaver at that time and I am happy to report to you gentlemen that there is no opposition today that we have heard of.

For your information, Senator McClellan, as you would say, Beaver Dam has some 2,000 card-carrying members, sir.

Speaking for the Arkansas Game and Fish Commission, we say to you, "Give us the family that hunts and fishes, and we will give you a family of good American citizens." We feel that citizenship is formed out in the open, close to nature. It is not fostered or helped in any manner in the honky tonk and the barrooms of the Nation.

We feel that the building of Beaver will certainly complete the covering of north Arkansas with dams where people can go and get close to nature and be in good, wholesome recreation. We urge you people to continue with this work on Beaver.

And finally, last but not least, speaking for the ordinary man on the street, I see where a very noted gentleman, speaking in Chicago this week, from England, he has said in effect there is no God. He says everything evolves. Be it whatever way it is, I say all the wonders of America and this Nation of ours came from God. Whether he is right or wrong, whether it evolves or came from God, there is no more rivers or streams being made today, or will not be any more made, so let's develop, gentlemen, and take care of what we have.

Thank you.

Senator McCLELLAN. Thank you, Mr. Robinson.

Mr. Chairman, that concludes the calling of the witnesses, I believe, whose names have been submitted to me.

I do have one more. Thank you.

Mr. Clyde Hiatt.

Mr. Hiatt, you are secretary of what association? Arkansas Association of Soil Conservation Districts?

All right.

STATEMENT OF CLYDE HIATT, SECRETARY-TREASURER, ARKANSAS ASSOCIATION OF SOIL CONSERVATION DISTRICTS

Mr. HIATT. Senator Kerr, Senator Moss, and Senator McClellan, my name is Clyde Hiatt. I am president of C–Bar Ranch, Inc. The corporation owns and operates a 4,400-acre farm and ranch in Franklin and Sebastian Counties. Incidentally, 2 miles of that land faces the Arkansas River and, brother, is it caving in.

I live in Charleston, Ark., where I serve as president of the American State Bank. I am chairman of the Franklin County Soil Conservation District and secretary-treasurer of the Arkansas State Association of Soil Conservation Districts. My statement is offered as a representative of this association.

In my opinion, there is no question but that the future growth and prosperity of our communities and State will be directly related to our efforts in controlling rainfall runoff and management and use of surface waters. Here in Arkansas we normally receive about 45 to 50 inches of rainfall each year. Yet we have been plagued by drought years. We have seen many communities hard hit by floodwaters. We have seen communities stagnate and decline because of the lack of a good water supply to attract or to keep industry. Our town of Charleston is now endeavoring to supplement its municipal water supply by adding storage to one of the reservoirs in the Six-Mile Creek pilot watershed project.

This Six-Mile Creek project was, in Arkansas, a forerunner of watershed projects now being planned and installed with Federal assistance, as provided under Public Law 566. The act provides Federal help toward encouraging communities in solving their water problems. Within the State we possibly have several hundred watersheds which would benefit from such a program. Local sponsors of 55 projects have made application for assistance. To date only 13 of these have been authorized for planning. Planning and installation of these works of improvement should be accelerated.

If we are to develop the full potential of these small watersheds, ways and means of encouraging multiple-purpose structures installation should be found. Storage for future municipal or industrial use could be built into our flood-prevention dams where it will obviously be needed in future years and local cost-sharing arrangements made as the communities work out the many details relating to the use of this storage. Such a procedure is not possible under present regulations.

Improvement is needed in the method of figuring local costs for adding municipal or industrial storage to flood-prevention dams built with assistance under Public Law 566. As a minimum, Federal as-

sistance should be provided on such a dual-purpose dam to defray all the construction cost of a flood-prevention, single-purpose dam, with local funds providing the incremental cost of the additional storage. At least we would understand this method better than the formula now used in cost sharing.

A real challenge faces our soil conservation districts, particularly in the delta section of the State, in supplying adequate technical assistance in the installation of efficient drainage and irrigation systems. The problems are many and complex. It has been estimated that between 2½ and 3 million acres will be under irrigation in the State by 1975, which is over two and one-half times the present irrigated acreage. As these irrigation systems are planned and installed, provisions must also be made for draining of these lands, for land smoothing and leveling. Means must be found of storing surface runoff water to reduce the demands of the decreasing ground supply. It is questionable that the present level of assistance to districts will be adequate to meet the challenge.

I thank you, gentlemen.

Senator McCLELLAN. Thank you, Mr. Hiatt.

Mr. Chairman, I believe that does conclude the list of witnesses that have been supplied to me. I would like to ask permission of the committee, however, to invite anyone else who may be present, any other citizens from Arkansas, who, if they are present and wish to make any statement, to send it to us.

Is there anyone else here who would like to make a brief statement to the committee?

If not, Mr. Chairman, then that concludes the presentation of witnesses from Arkansas. I personally wish to thank you and your committee for having scheduled this hearing in our State and giving our people an opportunity to present to you the facts that are associated with our water-resource problem and also to present to you their views with respect to the proper methods and requirements that may be needed to best develop, conserve, and utilize this great natural resource with which our State has so fortunately been endowed.

I wish also to compliment your committee first, and next I would like to compliment these witnesses who have appeared. I have been thinking, I can hardly recall a hearing conducted anywhere on any subject matter within the limited time you have been in session here this morning where a presentation has been made more concisely and the testimony given more pertinent to the matter under consideration, and I certainly wish to compliment our people. They have certainly demonstrated not only their interest but they have given thought to this and have come before you with irrefutable facts that support the overall, particularly the overall water-resource program that can be applied to Arkansas.

I wish to compliment your committee. I do not know how many, some 40 or 50 hearings you have scheduled, Senator Kerr——

The CHAIRMAN. It will approach that before we are through.

Senator McCLELLAN. I want to say if you will get the same results and the same cooperation, and comparable information in other hearings, that you have received here, your committee will certainly have performed a great service to the Congress and to the country in amassing this information. It will be invaluable to the Congress in considering future legislation and appropriations.

I thank you, sir, too, for the privilege of being here with you today.

The CHAIRMAN. Senator, we are mighty happy that you were here with us. I want to congratulate the fine witnesses who have appeared here and have given us both the able statements of their own thinking and views and at the same time had such an intelligent concept of the overall requirements for water conservation.

I would like at this time to present the gentleman who is directing our staff in what will be one of the very important efforts in connection with the operation and responsibility and recommendations and report of this committee. Mr. Ted Schad.

And I would appreciate it if he would introduce the other members of the staff and the group of workers who are with us here today representing our committee and others working with us.

Mr. SCHAD. Thank you, Mr. Chairman. One of the things that makes this job easier is that we do have a lot of very capable people who are giving their time and effort to us. We certainly appreciate very much the help that Senator McClellan has given us and also his assigning Clarence Byrns and Boyd Ridgway to help prepare the local groundwork for this hearing. I think they have done a wonderful job and I believe it is one of the best organized hearings that we have had.

We have a number of staff people who have come with us.

The chief clerk of our committee, Paul McBride.

A lot of the other Senators on the committee would like to have come to these hearings. I think all of them wanted to come but since they were not able to make it, many of them have sent their representatives.

Senator Hart, of Michigan, has sent Miss Muriel Ferris along.

Senator Anderson has sent Mr. Doyle Kline.

Senator Engle, of California, has sent Mr. Phil Dickinson.

Senator Kerr has very graciously made one of his secretaries available for the committee for this series of hearings, Miss Ada Lenz. I don't know whether she is here or not. She is doing our secretarial work.

The other committees of the Senate are cooperating fully in this study and the Interior and Insular Affairs Committee has assigned Mr. Gene Eaton to work with us and help with these hearings.

The Public Works Committee has assigned Mr. Johnny Mutz to work with us.

The Army has assigned an Army liaison officer, Col. Stan Kimmett, who handles the logistics of our transportation to get from place to place.

Is Stanley Kimmett back there?

And I do not want to close without mentioning the Alderson Reporting Co., who assigned Frank Smonskey to take the record of the hearing.

The CHAIRMAN. Thank you very much, Ted.

That concludes the hearing here in Fort Smith. We go from here to Oklahoma City for a hearing Monday.

(Whereupon, at 11:15 a.m. Saturday, November 28, 1959, the hearing adjourned.)

(Subsequent to the closing of the hearings, the following letter was received:)

STATE OF ARKANSAS,
GAME AND FISH COMMISSION,
Little Rock, December 29, 1959.

Senator ROBERT KERR,
Chairman, Senate Select Committee on Water Resources,
Senate Office Building, Washington, D.C.

DEAR SENATOR KERR: First, I wish to thank the chairman and members of the Senate Select Committee on Water Resources for this opportunity to submit a statement, making reference to the relationship of our wildlife and related recreational resources to water and water uses. The establishment of this committee constitutes a recognition by the Congress of the many water problems which confront all of us and of the importance of water to fish and wildlife and outdoor recreation.

As an agency charged with the administration and perpetuation of fish and wildlife resources, it is essential that we consider the impact of water use and management on these great resources. A rapidly increasing human population, increased leisure, greatly improved transportation facilities, and the pressures of civilized living, are bringing steadily increasing number of people to the fields, woods, and waters for rest and recreation. In fact, the demands for these recreation facilities are increasing much faster than our human population.

At the same time, other land and water uses are, in many instances, reducing wildlife habitats and their associated recreational opportunities. It is our belief that the perpetuation and increase of these recreational resources are essential to the physical and mental health of our country. They take no second place to other values.

In Arkansas, where a large percent of our people hunt and fish, and where the use of these resources by visitors from elsewhere is increasing by leaps and bounds, we are particularly aware of the value of these resources to the welfare of our State.

We wish to commend the Members of Congress for various actions and legislation which have recognized fish and wildlife values, and for their increasing interest in these resources. The enactment of Public Law 732 and its amendments, the Watershed Act and revisions affecting wildlife, the allocation of funds for establishment of wildlife refuges and waterfowl lands, Public Law 660, which provides grants for pollution abatement, and the recent creation of the Outdoor Recreation Resources Review Commission, are bringing many benefits to wildlife and demonstrate an awareness of the value of these resources.

We are much interested in such pending legislation as the Blatnik bill, to extend the pollution-abatement program, and the wilderness bill. We are sure that your interest in legislation important to these resources will continue.

Regarding current and future water management and its relation to fish and wildlife and recreation, we offer the following comments:

We are aware that there are many uses of water, and that these needs are often in conflict. Where these conflicts occur, compromises must be worked out. We believe, however, that the value of water for fish, wildlife, and recreation purposes is equal to, and sometimes outweighs, other beneficial uses. Water values for these purposes increase as it is appropriated to other uses.

Pollution is, of course, one of our biggest water problems, affecting both fish and wildlife, domestic and other uses of water. I am sure you are all aware of the pertinency of this problem and the critical need to eliminate pollution from our waters.

We would observe that water developments are often dedicated to a few limited objectives, but that the sometimes extensive and often unanticipated effects of these developments may affect resources in addition to and beyond these immediate objectives.

Of those types of water developments having an acute effect on wildlife, drainage and channelization often produce the most drastic results. We recognize the need for much drainage, but would call your attention to the fact that our waterfowl absolutely cannot exist without surface waters of a type which produces food and breeding places. Since nearly 85 percent of these surface waters in the United States have been drained, we should carefully balance the need for future drainage to produce more land against our waterfowl an recreational losses. We also note that these surface waters contribute to our underground waters, which produce our springs and stream sources. Along with these losses of wetlands, we lose bottomland and timber which furnishes wildlife habitat and hardwood for economic uses.

Channelization sometimes eliminates pools and shoals, often drastically alters the character of streams, and eliminates fish and wildlife habitat.

Irrigation sometimes so affects streams and reservoirs that they cannot support fish or other life.

Impoundments which have been and will be constructed provide vast acreages of water for certain types of recreational use, even though these benefits are largely incidental to the purposes for which they were built. Public Law 732 and amendments make possible the incorporation of plans to mitigate losses and include wildlife benefits. In connection with these impoundments, certain problems pertaining to recreational use are apparent. These include public access, alteration of water temperatures below impoundments eliminating native fishes, and diminishing fish populations in aging impoundments. Plans providing for enhancement of recreational values should be given primary consideration with other objectives.

We have another problem related to impoundments. We have extended impoundment plans to a point where we will, eventually, have inundated and altered all of our natural streams. Certain segments of our people believe we should set aside some of our high-quality streams, for preservation in their natural state, to conserve their beauty, aesthetic values, and particular types of stream fishing. In accordance with the laws of diminishing returns, high-quality streams that we preserve will become more valuable as more of them are impounded and altered. A positive program of this type needs to be instituted.

Wildlife and recreation, with which we are particularly concerned have very large monetary values which are recognized. I believe we cannot, however, place a dollar value on that "mental well-being" we derive from the use of these resources, and we should fully recognize this in our consideration of wildlife values.

As time progresses, our needs change, and I think we should periodically re-evaluate all the water-management plans which we have made in terms of new and future needs which become apparent.

Many of the plans for water management, the scope of which plans is tremendous, are derived from legislation originating with the Congress of the United States. As a citizen charged with the responsibility of administering wildlife resources, I respectfully request that this committee give careful and studied consideration to fish and wildlife and their related recreational values in the recommendations you submit to your colleagues in the Congress of the United States.

In closing, I wish to thank you again for the opportunity to submit this statement to the members of this Select Committee on Water Resources.

Yours very truly,

NELSON COX, *Director.*

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